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Original Article

Epidemiology of neglected tropical diseases with cutaneous manifestations (NTD-CM) at the CHU of Treichville, Côte d'Ivoire

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ABSTRACT

Context: Despite efforts to combat them, neglected tropical diseases with skin manifestations (NTD-CM) are still present, and the related information is fragmented, especially in urban areas of Côte d'Ivoire. **Objective:** To describe the different NTD-CM observed in the dermatology department of the CHU of Treichville. **Materials and Methods:** This retrospective, cross-sectional, and descriptive study was conducted in the dermatology and venereology department of the CHU of Treichville in Côte d'Ivoire. The study covered a 5-year period, from January 1, 2018, to December 31, 2022. All patients, regardless of age or sex, who were seen or hospitalized with a clinically and/or paraclinically confirmed neglected tropical disease with skin involvement were included. **Results:** NTD-CM represented 4.16% of dermatoses, with scabies being the most common (97.2%), followed by leprosy (1.1%), Buruli ulcer (1%), mycetoma (0.4%), basidiobolomycosis (0.3%), and mucormycosis (0.1%). Scabies was more prevalent in women, with a sex ratio (M/F) of 1.14, and the most affected age group was 2–17 years (23.5%). Leprosy predominated in males, with a sex ratio (M/F) of 3.4, and the lepromatous form was the most frequent (77.3%). Buruli ulcer was more common in male patients, with a sex ratio (M/F) of 2, and the most common complication was squamous cell carcinoma (50%). Mycetoma occurred predominantly in men (77.8%), with the foot being the most affected location (66.7%). Basidiobolomycosis showed an equal sex distribution, with the 2–17-year age group being the most represented (50%). One case of mucormycosis was diagnosed in a 12-year-old. **Conclusion:** NTD-CM are rare in urban areas (4.16% of dermatoses), but their impact on disadvantaged populations, especially children and youth, is significant. Increased awareness, improved hygiene, and investment in control measures are necessary to achieve the 2030 sustainable development goals.

Key words: Neglected tropical diseases, Scabies, Buruli ulcer, Africa

INTRODUCTION

Neglected tropical diseases (NTDs) are a group of infectious diseases that primarily occur in rural or urban areas of impoverished low- and middle-income countries [1]. These diseases affect approximately 1.5 billion people worldwide, 40% of whom reside in Africa [2]. They are caused by various infectious agents, including bacteria, parasites, fungi, toxins, and viruses, and are referred to as "neglected" because they have been historically overlooked by health systems and receive limited resources [3].

Of the twenty recognised NTDs worldwide, twelve are endemic in Côte d'Ivoire, ten of which have cutaneous manifestations [4]. These include Buruli ulcer, leprosy, mycetoma, chromoblastomycosis and other deep fungal infections, lymphatic filariasis, onchocerciasis,

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cutaneous leishmaniasis, post-kala-azar cutaneous leishmaniasis, scabies, and other ectoparasitoses such as tungiasis and yaws [5].

Despite ongoing efforts to control them, cutaneous NTDs (cNTDs) remain a public health concern, and the available data remain fragmented, particularly in urban areas. Therefore, we conducted this study with the objective of reporting the various cutaneous NTDs observed in the Department of Dermatology and Venereology at the University Hospital Centre (CHU) of Treichville. The aim was to describe the epidemiological and clinical characteristics of the main cNTDs encountered in this dermatology department.

MATERIALS AND METHODS

This was a retrospective cross-sectional study with a descriptive focus. It was conducted in the Department of Dermatology and Venereology at the University Hospital Centre of Treichville and covered a period of five years, from 1 January 2018 to 31 December 2022. The study population consisted of patients seen in outpatient consultations and/or hospitalised in the Dermatology and Venereology Department at CHU Treichville during the study period. All patients, regardless of age or sex, with a clinical and/or paraclinical diagnosis of cutaneous neglected tropical diseases (cNTDs) who were referred to and treated in the department were included. Patients whose medical records lacked socio-demographic information were excluded.

Data collection was performed using survey forms that included the following variables: socio-demographic data; duration of the lesion(s); reason for consultation; paraclinical examinations; and type of NTD diagnosed. Data were recorded and analysed using Epi Info version 7. Statistical analysis involved calculation of means and standard deviations for quantitative variables, and proportions for qualitative variables.

RESULTS

Prevalence

During the study period, 50,542 records were reviewed, and 2,105 cases of neglected tropical diseases with skin manifestations (cNTDs) were identified. Of these, 2,073 cases were included in our study, as patients whose medical records lacked socio-demographic information were excluded. The prevalence was therefore 4.16%. Among the cNTDs recorded, scabies was the most frequent neglected tropical dermatosis, accounting for 2,014 cases (97.2%), followed by leprosy with 22 cases (1.1%) and Buruli ulcer with 21 cases (1%). Additionally, there were 9 cases of mycetoma (0.4%), 6 cases of basidiobolomycosis (0.3%), and one case of mucormycosis affecting the face in a 12-year-old adolescent.

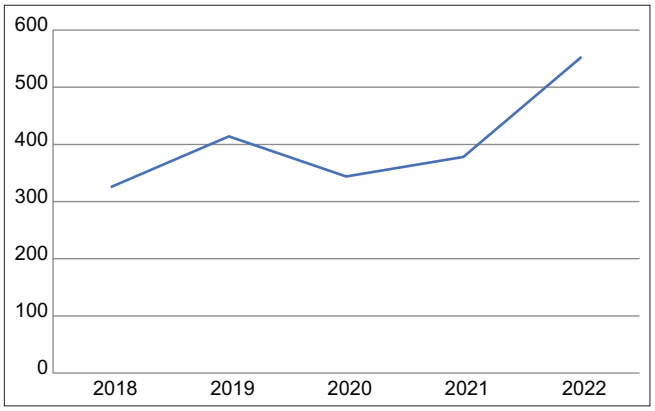
Socio-demographic characteristics of the main cNTDs

Scabies

There was a female predominance, with a sex ratio (F/M) of 1.14. Ages ranged from 3 months to 85 years, and the most affected age group was 2 to 17 years. The median age was 24 years, with a standard deviation of 17.58. Students were the most represented occupational group, accounting for 689 cases (34.4%). Patients with no income were the largest group, with 1,062 cases (53.1%), followed by those of low socioeconomic status with 534 cases (26.7%). There was a steady annual increase in the number of scabies cases (Fig. 1); (Graph. 1).

Leprosy

Male sex predominated, with a sex ratio (M/F) of 3.4. The median age was 31 years, ranging from 15 to 71 years. The age group 26 to 36 years was the most affected. The number of leprosy cases remained stable from 2018 to 2020, followed by a slight increase of five cases in 2021. Patients engaged in liberal professions were the most affected, with 6 cases (28.6%), followed by pupils and students with 5 cases (23.8%). Most patients with leprosy had a low socioeconomic status (52.4%). The majority of leprosy cases were of the lepromatous form, counting 17 patients (77.3%) (Fig. 2).



Graph 1: Distribution of patients with scabies by year.

Buruli Ulcer

Male sex predominated, with a sex ratio (M/F) of 2. The median age was 34 years, ranging from 6 to 73 years. Adults aged between 36 and 56 years were the most affected, with 7 cases (35%). Patients were more frequently residents of Abidjan, accounting for 14 cases (66.7%). Nearly half of the patients with Buruli ulcer had a low socioeconomic status (47.4%). Squamous cell carcinoma was the most common complication, occurring in 5 cases (50%), followed by unstable scars in 3 cases (30%).

Mycetoma

Male sex predominated in the mycetoma group, with 7 cases (77.8%). Most patients with mycetoma resided in Abidjan (88.9%). The age of patients ranged from 19 to 62 years, with a median age of 33 years. The most affected age group was 17 to 26 years, with 4 cases (44.4%). Patients with mycetoma primarily lived in urban areas, with 8 cases (88.9%), and had a low socioeconomic status (88.8%). The pedal location was the most frequently observed, in 66.7% of cases (Fig. 3).

Basidiobolomycosis

There was no sex predominance. Ages ranged from 9 to 65 years, with a median age of 27. The most affected age group was 2 to 17 years, accounting for 3 cases (50%). Most patients originated from outside Abidjan (66.7%). Patients with no income and those of low socioeconomic status were the most affected, representing 50% and 33.3%, respectively (Fig. 4).

DISCUSSION

Prevalence

Cutaneous neglected tropical diseases (cNTDs) accounted for 4.16% of dermatoses in the Dermatology Department of the University Hospital Centre (CHU) of Treichville during our study period. This prevalence is lower than that reported in the literature, which estimates that cNTDs represent around 10% of skin diseases in most communities. This discrepancy may be explained by the presence of specific management programmes for certain cNTDs, to which patients are referred by general practitioners, thereby reducing the number of consultations in the department.

Furthermore, the cases that reach us tend to be those poorly recognised or for which general practitioners have failed to provide a diagnosis or effective treatment. Six cNTDs were recorded, in order of frequency: scabies, leprosy, Buruli ulcer, mycetoma, basidiobolomycosis, and mucormycosis.

Socio-demographic characteristics of NTD-CM

Scabies

Scabies is widespread worldwide and the frequencies in the literature vary, ranging from 0.2 to 71% [6-8]. In our study, we observed a hospital prevalence of 3.99%, which was slightly lower than 5 % observed by Faye et al. in Bamako, Mali, [5]. This minor difference reflects the comparable socio-demographic characteristics of the cities of Bamako and Abidjan.

Our study revealed a female predominance in scabies cases, with women accounting for 53.5% compared to 46.5% men. However, in one series in the USA, men were in the majority (men 54%, women 46%) [9]. This is in line with the conventional data that scabies affects all individuals without distinction of sex [10,11].

All age groups were affected, with a slight predominance in the 2-17 age group, representing 23.5%. This is in accordance with the literature data because scabies affects all individuals regardless of age [10,11]. However, scabies is common in children and young adults [10], as found in our study.

Students were the most affected group, accounting for 689 cases (34.4%), similar to the findings of Kobangué et al., who reported a significant impact on disadvantaged groups, with preschoolers and pupils/students representing 25.5% and 26.3% respectively [12].

This high transmission rate among students can be attributed to overcrowding within schools and inadequate hygiene practices among some pupils.

Leprosy

The prevalence rate of leprosy (per 10,000 inhabitants) in Côte d'Ivoire was 0.15 in 2020 and 0.17 in 2021 respectively [13,14]. Our results are in line with the national data with a prevalence of 0.04%.

This confirms that leprosy is no longer a public health problem in Côte d'Ivoire. Elimination of leprosy as a public health problem, with a prevalence of less than 1 case per 10,000 population, was achieved globally in 2000 in most countries [15].

However, the number of new cases remains very high in some countries. In southern Brazil, the average

detection rate was 1.61 new cases per 100,000 population; 2.6/100,000 in 5 districts in Chad, 1.32 per 100,000 inhabitants in Benin [16-18]. Vigilance must be in place in our country because since 2021 we have seen a slight increase in the number of cases at the dermatology department of the CHU de Treichville.

The most common clinical form of leprosy in our study was the lepromatous form with 17 cases, or 77.3%. According to the WHO, multibacillary leprosy (MB) accounts for 77.3% of all forms of leprosy [15]. This proportion is below those reported in Brazil 79% MB, Chad 83.1% MB, Europe 84% MB, Benin 90% MB [16–19]. Our study shows that leprosy remains in Côte d'Ivoire and that, in order to maintain the level of elimination reached since 2001 [20], it is necessary to improve hygiene conditions, reduce the transmission of leprosy through active surveillance, early detection, Contact research and patient treatment.

Buruli ulcer

In our study, the proportion of adult patients was high (35%). This is contrary to the literature [21-24]. Indeed, Kanga et al. in Côte d'Ivoire, Saka et al. in Togo reported a predominance of cases of Buruli ulcer in children under 15 years old in 56.9% and 56.3% respectively [2,23]. This difference may be explained by the fact that most of our patients had complications so they were seen at a late age. The risk of cancer is common in the long term. During our study period, we observed 5 cases (50%) of squamous cell carcinoma compared to 8 cases (for 5 years) in the series reported by Kaloga et al. in Côte d'Ivoire, in a study conducted at the dermatology department of the CHU de Treichville. In this series, young adults who had the Buruli ulcer during their childhood were involved [25]. It is therefore important to follow up the patients regularly over long term, in order to detect any changes in the Buruli ulcer scars.

Mycetoma

The mycetoma, although rare, is present in Côte d'Ivoire. A study conducted exclusively in Abidjan showed that there are cases of indigenous mycetoma in Côte d'Ivoire [26]. However, there are frequent cases of mycetoma imported through immigration. We also believe that the prevalence is underestimated due to inadequate patient referral. Mycetoma was more common among men in our series. This finding is consistent with results from studies conducted in Tunisia (where the male-to-female ratio was approximately 12:6), Kenya, Senegal and Ivory Coast, which reported male proportions of 74.1%, 79.6%, 79.6% and 79.6% respectively [27-29].

In our study, the patients came from various districts of Abidjan, therefore from an urban area. We believe there is a bias because the true place of origin of the patients was not recorded in their files. A prospective study is necessary to better appreciate this characteristic of mycetome. Farmers were the most affected (33.3% of cases). This could be explained by poor hygiene practices such as the lack of footwear during field work. It will be necessary to raise awareness of the use of protective equipment during agricultural activities.

The main location was the lower limb with 66.7%. Foot lesions were most common (72.5%) in Senegal [29], 84.6% of cases with feet in the thesis of Abiba et al in Bamako, 78% in Tunisia [27] justifying the term "foot of Madura". This preferential location is explained by the more frequent exposure of men to trauma and sting during their activities.

Basidiobolomycosis

Basidiobolomycosis is a rare deep fungal infection. We observed 6 cases in our series. Sangaré et al. observed 10 cases in eleven years in the dermatology department in Abidjan [30,31], 7 cases were observed over a period of 6 years in the study of Atadokpédé et al., in Benin [32]. When Kombaté et al. reported 172 cases in 40 years in a global review, an annual frequency of 4 cases [33]. However, we believe that our data are underestimated because not all patients are referred to us, and also because not all suspected cases are confirmed due to a lack of financial resources to carry out paraclinical investigations.

Basidiobolomycosis affects young people much more. 50% of our patients were under 15 years old and were students. The extreme ages are between 3 and 13 years, with an average of 7 years in the study by Sangaré et al. [31]. When Kombaté et al. found that 70% of patients were under 15 years old [33].

Mucormycosis

Mucormycosis are rare fungal infections that are often fatal. They occur in debilitated patients but also affect immunocompetent individuals.

In our study, mucormycosis was observed in a socially disadvantaged patient, weakened by poverty, with lesions located on the face. This is consistent with the data in the literature [34]. Mucormycosis was most

commonly observed in immunocompromised patients (4 cases out of 5) and the most frequent locations were rhino-cerebral and rhino-orbital in a study conducted by Bellazreg F et al. in Tunisia. [35]

This study has shown that neglected tropical diseases with skin manifestations are rare, with a prevalence of 4.16% of dermatosis in urban areas. In order of frequency, scabies (97.2%), leprosy (1.1%), buruli ulcer (1%), mycetoma, basidiobolomycosis and mucormycosis were reported.

Because of their pernicious evolution, they can be a source of diagnostic error, leading to irreversible complications. This requires early diagnosis and prompt treatment.

The disadvantaged; children, young people, students and those without or with low incomes pay the heavy price. This could affect students' academic performance. Their hygiene conditions need to be improved and made more aware. To maintain the progress already made, more investment in NTD-CM will be needed to achieve the 2030 Sustainable Development Goals.

CONCLUSION

This study has shown that neglected tropical diseases with skin manifestations are rare, with a prevalence of 4.16% of dermatosis in urban areas. In order of frequency, scabies (97.2%), leprosy (1.1%), buruli ulcer (1%), mycetoma, basidiobolomycosis and mucormycosis were reported.

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